

### REMARKS

Applicants thank the Examiner for total consideration given the present application. Claims 1-20 are currently pending of which claims 8-20 are withdrawn as being directed to non-elected species. Applicants respectfully request reconsideration of the rejected claims in light of the remarks presented herein, and earnestly seek timely allowance of all pending claims.

#### 35 U.S.C. § 103 REJECTION – Vetrovec, Young, Brauch

The Examiner rejects claims 1-5 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Vetrovec (U.S. Patent No. 7,085,304)[hereinafter “Vetrovec”] and further in view of Young (U.S. Patent No. 3,611,185)[hereinafter “Young”]. The Examiner also rejects claims 1 and 6 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Brauch et al. (U.S. Patent No. 5,553,088)[hereinafter “Brauch”] and further in view of Young. Claim 7 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Brauch, as applied to claim 1 above.

These rejections are respectfully traversed.

Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness. To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Additionally, there must be a reason why one of ordinary skill in the art would modify the reference or combine reference teachings to obtain the invention. A patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. *KSR Int'l Co. v Teleflex Inc.*, 82 USPQ2d 1385 (U.S. 2007). There must be a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. *Id.* The Supreme Court of the United States has recently held that the “teaching, suggestion, motivation test” is a valid test for obviousness, albeit one which cannot be too rigidly applied. *Id.* Rejections on obviousness grounds cannot be sustained by mere

**conclusory statements**; instead, there **must be some articulated reasoning** with some rationale underpinning to support the legal conclusion of obviousness. *Id.*

In this instance, none of Vetovec, Young, and Brauch, alone or in combination, teaches or suggests each and every claimed element. For example, independent claim 1 recites, *inter alia*, “the sizes having a relationship given by  $b=a/\cos\theta$ , where  $\theta$  is an incidence angle at which said laser light is incident upon the laser light incidence surface, wherein the value of incidence **angle  $\theta$  provides a relationship given by  $b>a$**  and wherein said laser light is beam shaped having a diameter  $c$  and the solid state laser medium is constructed such that a **constant ratio** between the beam diameter  $c$  of the laser light and the size of the solid state laser medium in both directions is maintained.” *Emphasis added.*

It is respectfully submitted that Vetovec fails to teach or suggest the above-identified claim feature.

As previously submitted, Vetovec merely discloses a conventional amplifier module for amplifying a source light in a solid state laser. The amplifier module includes a disk 12 having a diameter of about 10-300 mm ( $D_c$ ). The disk 12 also includes two substantially parallel surfaces 22, 24 and an optical laser gain material 26 having a diameter ( $D_L$ ). The optical laser gain material is capable of amplifying a laser beam 64 in response to an optical pump radiation 36. Laser gain material 26 may be implemented with suitable optical material having a host lattice doped with suitable ions capable of being pumped to laser transition. When the laser beam 64 has an angle of incidence with disk 12 that is approximately normal, the perimeter of gain medium 26 may be circular or nearly circular to provide good mode fill. However, when the laser beam 64 has an angle of incidence that is significantly off of the normal, the perimeter of gain medium 26 may be more elliptical in shape. (*See col. 6, lines 4-25.*)

Vetovec is distinguished from the claimed invention in that nowhere does Vetovec teach or suggest the relationship between the laser beam 64 and the size of the disk 12 or the optical laser gain material 26. Particularly, Vetovec **fails to teach** that the disk 12 or the optical

laser gain material 26 is constructed such that a constant ratio between a diameter of the laser beam 64 and the size of the disk 12 or the optical laser gain material 26.

In this instance, the Examiner merely provides a conclusory statement without providing any articulated reasoning with some rationale underpinning to support the legal conclusion of obviousness. The Examiner relies on Fig. 12 of Vetovec as disclosing the claimed "constant ratio". More specifically, the Examiner alleges that Fig. 12 shows a laser beam 64 with a uniform diameter. The Examiner further points to col. 6, lines 43-46 for supporting her allegation that the solid state laser medium is constructed such that a constant ratio between the beam diameter  $c$  of the laser light and the size of the solid state laser medium in both directions is maintained. It is respectfully submitted that the Examiner's such allegation is totally unfounded. Although it may be true that Vetovec shows a laser beam 64 with a uniform diameter, there is no support in the entire reference that the disk 12 or the optical laser gain material 26 is constructed such that a constant ratio between a diameter of the laser beam 64 and the size of the disk 12 or the optical laser gain material 26.

Further, Vetovec does not disclose that the laser beam 64 has a uniform diameter. Vetovec merely discloses that the particular arrangement of diode bars 68 and groups 67 of diode bars 68 may be chosen in combination with the particular doping of gain medium 26 to produce a substantially uniform gain over a large portion of disk 12. There is neither mention of "uniform diameter" nor any support for the allegation that a laser beam having a uniform diameter and uniform gain would provide a constant ratio between a diameter of the laser beam 64 and the size of the disk 12 or the optical laser gain material 26.

In addition, the Examiner acknowledges that Vetovec fails to teach or suggest, "*the size have a relationship given by  $b = a/\cos\theta$ , wherein the value of the incidence angle  $\theta$  provides a relationship given by  $b > a$* " as recited in claim 1. Thus, the Examiner imports Young to fulfill this deficiency of Vetovec. It is noted, however, that the Examiner merely concludes that Young discloses the above-identified feature without citing any relevant portion from this reference.

As understood, Young is particularly concerned in increasing the amount of pump light utilizing a unitary laser system with a rod 11 of laser glass. This rod 11 is oval in cross-section and extends between two flash lamps 15, 17 and the end faces of the rod 11 are in parallel planes. Although young discloses that the ends of rod 11 can be cut at Brewster's angle to minimize reflection from these end faces, there is no mention in the entire reference that *the size of the oval-shaped rod have a relationship given by  $b = a/\cos\theta$ , wherein the value of the incidence angle  $\theta$  provides a relationship given by  $b > a$*  where rod 11 having a size of  $a$  in a direction perpendicular to a plane defined by both an optical axis of said laser light and a normal to the laser light incidence surface of rod 11, and a size of  $b$  in a longitudinal direction perpendicular to the direction and the normal.

In regard to Brauch, the Examiner provides the same rationale as Vetrovec. Thus, at least for the reasons stated above with respect to Vetrovec, it is respectfully submitted that Brauch fails to teach or suggest the above-identified claim features of independent claim 1.

As demonstrated above in great detail, the cited prior art references fail to disclose a laser beam having a uniform diameter and a uniform gain. The cited references in combination merely disclose that a laser light is incident on a laser medium slantwise. Thereby, according to the cited references, to increase size of a cooling surface and to extract energy from a laser medium efficiently cannot be compatible.

In contrast, since the present invention is characterized in that "a constant ratio between the beam diameter  $c$  of the laser light and the size of the solid state laser medium in both directions is maintained", the present invention can solve the above-mentioned technical problem.

Additionally, as demonstrated above, Young merely discloses that input/output ends of the rod are cut at Brewster angle generally in order to prevent Fresnel reflection at the both ends. Thus, it is respectfully submitted that Young fails to disclose a laser beam having a uniform diameter and a uniform gain described in the present invention.

Therefore, for at least these reasons, independent claim 1 is distinguishable from Vetovec, Young, and Brauch. Claims 2-7 depend from claim 1, directly or indirectly. Therefore, for at least the reasons stated with respect to claim 1, claims 2-7 are also distinguishable from the applied prior art references.

Accordingly, Applicant respectfully requests that the rejection of claims 1-7 be withdrawn.

### CONCLUSION


In view of the above amendment, Applicants believe the pending application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Ali M. Imam Reg. No. 58,755 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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